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Alberta Geological Survey

# ROCK CHIPS

A Newsletter published by the Alberta Geological Survey for the geoscience community of Alberta.

Fall/winter 1991

# Alberta minerals data base now available

*Information on industrial and metallic minerals in Alberta is readily accessible through the Mineral Deposits and Occurrences File (AMDO).*

The Alberta Geological Survey undertakes systematic data collection on hundreds of mineral deposits in the province. More than 30 potentially economic minerals are found in Alberta, most of which are industrial, although some are metallic.

**The Alberta Mineral Deposits and Occurrences File (AMDO)**

These data are captured in the Alberta Mineral Deposits and Occurrences (AMDO) file and include systematic information on geological setting and resource attributes. Careful checks have been made to ensure the validity and consistency of data and the overall integrity of the database. In addition, software has been designed to facilitate selective retrieval of mineral deposit information.

**Mineral Classifications**

The mineral types contained in the database are classified into five major categories based on geologic origin and setting:

- chemical and biogenic sediments
- evaporites
- terrigenous clastics: fine and coarse
- igneous emplacements
- miscellaneous

Ready access to these data, as well as their integration into other resource data systems, is essential for effective resource management, exploration and development.

**System Formats**

The AMDO file provides access to data in three different modes, each catering to the software and system capabilities of particular user segments.

One access mode is HyperCard, a software package supplied with Macintosh computers, on which AMDO is now fully operational. HyperCard does not require special training. A user-friendly manual describes the nature and content of each file as well as procedures for accessing and searching the AMDO.

A second access mode is compatible with the IBM-PC, a standard operating tool for many organizations. Data transfer to IBM involves translation of HyperCard data into formats readable by standard IBM-PC software.

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Please address any questions or comments to Mike Prentice:

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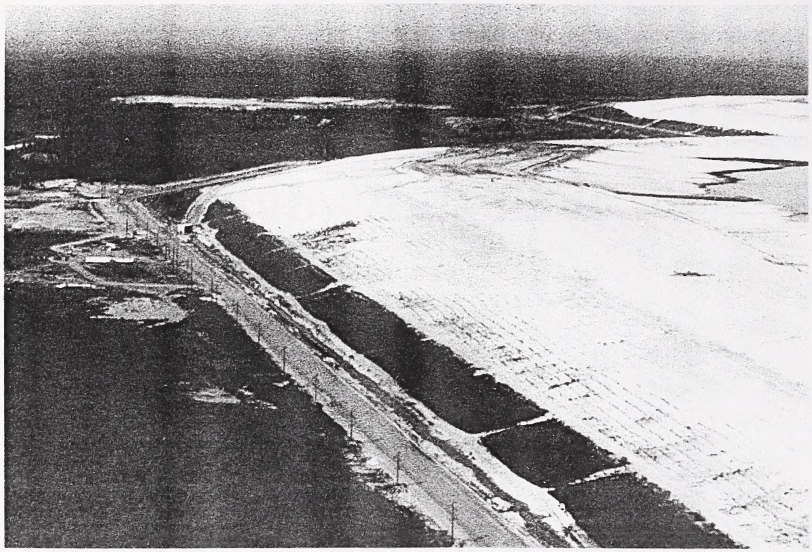
ALBERTA RESEARCH COUNCIL

# AGS helps tackle environmental challenge



*AGS investigations into the viability of deep disposal of residual water from in-situ recovery projects and open-pit mining operations will provide base-line information for local-scale environmental assessments in the Athabasca Oil Sands Area.*

The Alberta Geological Survey (AGS) has embarked on a regional-scale hydrogeological study aimed at supporting sustainable development of the province's bitumen resources. The program, focussed on the Athabasca Oil Sands Area in northeast Alberta (Twp. 70-103, W 4 Mer), will provide an information base for local-scale environmental assessment of the effects of deep disposal of residual water.

Currently in the Athabasca area residual waters from both mining and in-situ methods of oil extraction represent a significant environmental challenge. As development continues and tailing ponds reach full capacity, consideration is being given to injection of produced water from mining operations. In addition, deep injection of residual water is an option for in-situ operations including underground extraction sites such as the Underground Test Facility of the Alberta Oil Sands Technology and Research Authority, near Fort McMurray.

However, before proceeding with the deep disposal of the produced water, there is a need for proper evaluation of its effects. The current AGS program builds on experience developed in earlier studies of the Cold Lake area and Swan Hills Waste Disposal site. The project is assessing three general types of constraints that need to be considered in the evaluation of potential sites for deep injection. Broadly these constraints relate to:

- the natural subsurface hydrogeological regime
- the integrity of the injection aquifer and adjacent hydrostratigraphic units
- prevention of contamination of existing and potential petroleum, mineral and water resources.

In the Athabasca Oil Sands Area there are particular conditions which impose more restrictions on the ability to dispose of residual water by deep injection. These are:

- the relatively thin sedimentary sequence
- the internal hydrostratigraphy of the sedimentary rocks
- the erosion and outcropping of Cretaceous and Devonian strata both along the Athabasca River Drainage system and toward the eastern margin of the basin.

Phase 1 of the program, completed in March 1991, assessed the complex geology and hydrostratigraphy of the study area resulting from various salt dissolution and erosional events characteristic of the region.

Phase 2 of the program is now underway and is focussed on analysis of the hydrogeological regime of formation waters. This portion of the program is being conducted using chemical analyses of formation waters, an estimated 2500 drillstem tests and over 400,000 core analyses to interpret the flow regime of formation waters. A report on this component of the program is scheduled for the spring of 1992.

The Alberta Geological Survey is carrying out this program in cooperation with Environment Canada and the Alberta Oil Sands Technology and Research Authority.

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For more information,
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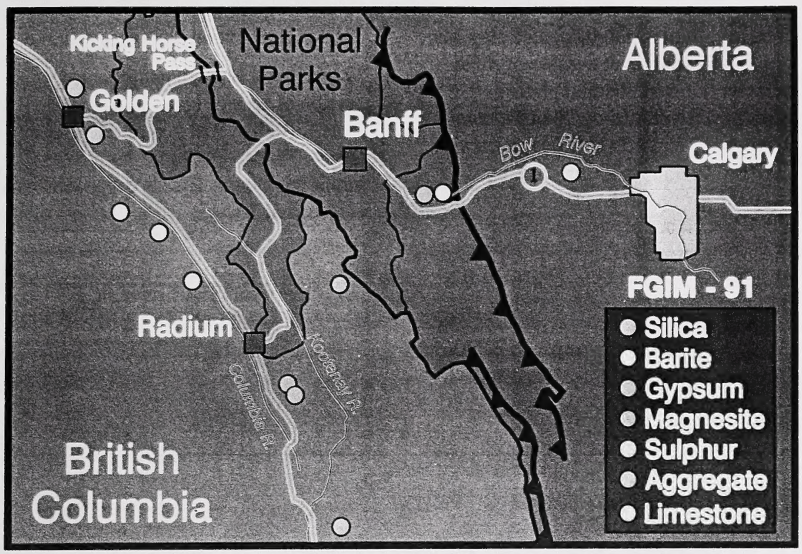
# Minerals Forum an overwhelming success




*The 1991 Industrial Minerals Forum featured field trips that toured several major industrial operations in the Rocky Mountains of Alberta and British Columbia.*

Although Alberta may be best known for its oil and gas resources, it also has a 600 million-dollar-a-year industrial minerals industry. And where would we be without limestone for cement, clays for making ceramics and paper, gravel for roads, silica sand for glass and windows, or sulphur for fertilizers?

The importance of these commodities to the economy of Alberta was the basis for the 27th Forum on the Geology of Industrial Minerals held at the Banff Springs Hotel, May 5 to 10, 1991.

Forum delegates, from across North America and Europe, had an opportunity to see the scope and diversity of the resources in Alberta and British Columbia through a series of technical sessions, field trips and plant tours.

Presentations showcased a wide variety of activity from the industrial minerals sector including new developments related to diamonds, sulphur, potash and limestone.

Field trips included: a one-day trip through the Bow Valley/Canmore region to visit operations of the Shell sulphur plant at Jumping Pound, the Continental Lime plant, the Lafarge Canada cement plant and other industrial operations, and trips through the East Kootenay region of British Columbia.

The Forum, co-hosted by the Alberta and British Columbia Geological Surveys, attracted approximately 200 delegates. This was the first time in its 27-year history that the event has been held in Western Canada, and only the second time in Canada.

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For more information,
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Wylie Hamilton 438-7634

Banff Forum '91
Geology of Industrial Minerals

## Minerals data base con't

The third access mode is through a geoscience information system (GSIS) which is currently being developed. This access mode will permit data to be integrated with other resource information on a provincial scale. It will also provide graphic outputs which will facilitate the production of a mineral deposits map for the province.

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For more information,
please contact:
Wylie Hamilton or Monica Price,
438-7676

# AGS management changes

Dr. Rand Harrison, Department Head, has made the following changes to the Alberta Geological Survey managment team effective January 1, 1992:

l. The Oil Sands Section and the Petroleum Geology and Basin Analysis Section will be combined into one section called "Petroleum Geoscience". Dr. Stefan Bachu, currently Manager of the Petroleum Geology and Basin Analysis Section, has been appointed Manager of the newly-expanded section.

2. Mr. Rick Richardson, who has served as Acting Manager over the past year, has been appointed Manager responsible for the Industrial and Metallic Minerals Section and the Coal Geoscience Section.

3. Dr. Daryl Wightman, who has served as Acting Manager and Manager of the Oil Sands Geology Section since the fall of 1988, has relinquished his management responsibilities in order to fully commit his time, effort, and expertise to scientific research and support to the Department's petroleum-oriented projects

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# AGS hosts Japanese coal industry visit

For two weeks in August the Alberta Geological Survey was host to a Japanese delegation of engineers, geologist and businessmen here to familiarize themselves with the coal resources of Alberta. The visit, entirely sponsored by the Japanese New Energy Development Organization (NEDO), consisted of a series of tours which allowed the Japanese to see the resource first-hand and meet many of the principle coal players in the province.

The highlight of the two week stay saw the Japanese tour an number of mine sites in the foothills and plains. Cardinal River Mines, Obed Mountain Coal and TransAlta Utilities all provided tours of their operations. During their stay the group also visited a number of coal geoscience centres including the Energy Resources Conservation Board in Calgary and the Coal Research Centre near Edmonton.

The stop in Alberta was part of a North American tour which included visits to Ottawa and several U.S. destinations.

The trip was also the reciprocal portion of an arrangement that saw three Canadian coal geoscience experts travel to Japan earlier in the summer including Dennis Nikols of the Alberta Geological Survey.

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For more information, please contact:
Dennis Nikols 438-7622

# Recent publications

**Environmental Geology**

- Results from the deep waste disposal workshop, 1991. Information series 115, $10.
- Hydrogeology of the Swan Hills Area, Alberta: Evaluation for deep waste injection. Bulletin 58, $15.
- Evaluation of effects of deep waste injection in the Cold Lake area, Alberta. Bulletin 60, $15.

**Petroleum Geology and Basin Analysis**

- The origin, history and regional structural development of the Peace River Arch, western Canada basin. Contribution series no. 2029, $3.
- Hydrogeology, geopressures and hydrocarbon occurrences, Beaufort-Mackenzie basin. Contribution series no.1871, $3.
- Tectonic loading in the Canadian cordillera as recorded by foreland basin sedimentation. Contribution series no. 2030, $3.
- Hydrochemistry of the Peace River Arch area, Alberta and British Columbia. Open file report 1990-18, $10.

**Coal Geology**

- Regional coal maps (1:250 000) $85 for hardcopy or $20 on diskettes each:
  - Donald Flats; NTS 83E/16 Open file report 1991-7
  - Bolton Creek; NTS 83L/2 Open file report 1991-8
  - Copton Creek; NTS 83L/3 Open file report 1990-9
  - Praire Creek; NTS 83L/7 Open file report 1990-10
  - Cutbank River; NTS 83L/10 Open file 1991-11
- Coal bed methane in Alberta - what's it all about, seminar notes. Information series 108, $20
- Coal Geology and its application to coal bed methane reservoirs, Information series 109, $15.
- Surface geophysical coal research project (1984-1986), final report, 1991. Information series 112, $20.

**Oil Sands Geology**

- McMurray Formation and Wabiskaw Member (Clearwater Formation): regional perspectives derived from the north Primrose area, Alberta, Canada. Contribution series 2038, $3.
- Resource characterization of the central region of the lower Cretaceous McMurray/Wabiskaw deposit, Athabasca oil sands area, northeastern Alberta. Contribution series no.1639, $3.

**Minerals**

- Alberta mineral deposits and occurrences file. Open file report 1991-17, $20.
- The ceramic potential of Alberta clays and shales, 1991. Economic geology report #7, $15.
- An evaluation of the mineral potential in norteastern Alberta, Open file report 1991-6, $20.
- Placer gold occurrences in Alberta. Open file report 1990-9, $10.

**Publications can be obtained from: Alberta Research Council, Publications Office, Box 8330, Station F, Edmonton, Alberta, T6H 5X2, Telephone: (403) 450-5390 , FAX: (403) 461-2651 (major credit cards accepted).**